A SECOND DISCOVERY OF *SCENEDESMUS GRAHNEISII* (HEYNIG) FOTT IN HUNGARY

A. Schmidt

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Abstract. This paper presents environmental and water chemical data from the second Hungarian discovery of the chlorococcal alga, *Scenedesmus grahneisii* (Heynig) Fott. Dimensions and morphological characteristics of the cells and coenobia are the same, as given in the literature.

Keywords: ***Didymocystis****, distribution,* ***Scenedesmus****, taxonomy, water quality.*

A. Schmidt, Environmental Protection Authority, South Danube Region, H-6501 Baja, P.O. Box 353. Hungary

Introduction

The basionym of *Scenedesmus grahneisii* is *Didymocystis grahneisii*, which was described by Heynig (1962). This taxon also includes *Didymocystis comasii* Kom. (Hegewald and Silva, 1988). Previous discoveries identified two celled and four celled coenobia coexisting in the same sample (Fott, 1973; Hindák and Klasová, 1974; Schmidt and Uherkovich, 1976; Uherkovich and Rai, 1977; Tsarenko, 1990). Fott (1973) corrected the name from *Didymocystis grahneisii* to *Scenedesmus grahneisii*. The early data about *Scenedesmus grahneisii* were mainly from Middle Europe: Germany (Heynig, 1962, 1984; Krienitz, 1984, 1988), Switzerland (Fott, 1973), Slovakia (Hindák and Klasová, 1974; Hindák and Holod, 1983), Hungary (Schmidt and Uherkovich, 1976; Schmidt 1978) and Ukraine (Tsarenko, 1990). This alga has also been discovered outside of Europe in both Cuba (Komarek and Fott, 1983) and Africa (Uherkovich and Rai, 1977).

The first Hungarian discovery occurred in a shallow lake (Vadkerti-tó), on the Great Hungarian Plain, between the rivers Danube and Tisza. The characteristic chemical data of this water were: pH 8.5, salt content 785 mg/dm^3, dominant ions Mg^{2+} and HCO_3^-. About half of the coenobia was two celled, while the other half was four celled (Schmidt and Uherkovich, 1976).

Two other, very similar taxa have been found in Hungary. They were described as *Scenedesmus berczikii* Hortob. from the Danube river at Budapest (Hortobágyi, 1975) and *Scenedesmus grahneisii f. crassicostatus* A. Schmidt (instead of "*crassicostata*", see Schmidt, 1978; Hegewald and Silva, 1988) from the shallow lake Vadkerti-tó. Both of which may be synonyms of *Scenedesmus grahneisii*, because these new taxa differ only by their shield-like, scabrous thickening (Hegewald and Silva, 1988).

However, Uherkovich (1992) in a recent manuscript has published that these three taxa are valid.

Methods

Water samples were collected for chemical and microscopic studies from the backwaters of the river Tisza at the village Tiszadob (504 river km). These backwaters are located in an environmental protection area, called "Tiszadob Nature Reserve" (Lakatos, 1991).

The samples were collected twice on the 17th and 29th October, 1992. These samples were drawn from each end of the Malom-Tisza (Fig. 1.). We followed the Hungarian Standards for determining the chemical parameters. Conductivity, pH, dominant ions, nutrient ions and chemical oxygen demand (COD) were measured.

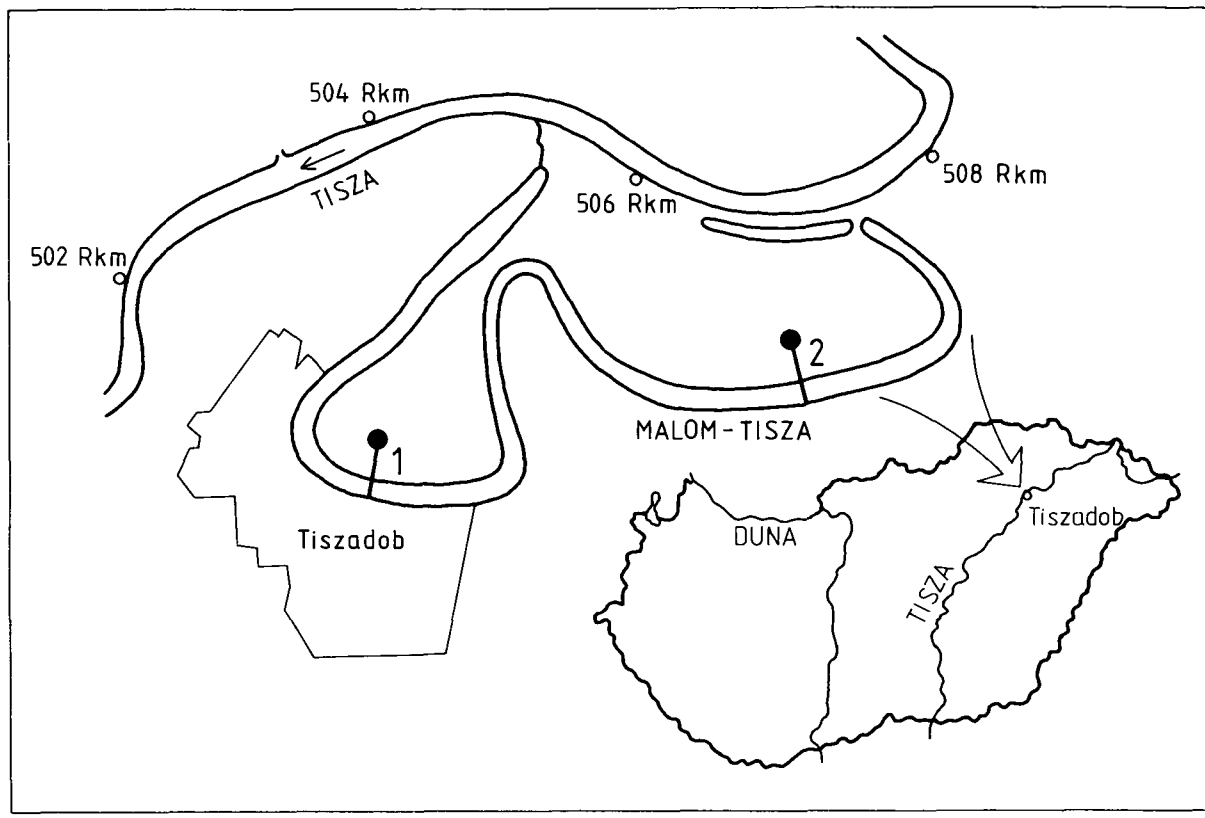

Fig. 1. Map of the backwaters at Tiszadob

Discussion

The results of the chemical data analysis show, that the water quality is similar at both ends of the Malom-Tisza. Based on the conductivity data (Table 1.) it is a middle sort fresh water (beta-alfa oligohalobic class, see Felföldy, 1987 p. 25). The dominant ions are Ca^{2+}, Mg^{2+} and HCO_3^-. The level of the nutrient material for plant organisms (NH_4^+, NO_3^-, PO_4^{3-}) is very low (Table 1.) The inorganic data show that this water is of medium quality.

The organic materials, based on COD-$K_2Cr_2O_7$ data show a higher level, in spite of the fact that waste water is not discharged into this backwater. The relationship between COD-$K_2Cr_2O_7$ and COD-$KMnO_4$ may indicate humin materials in the water.

The phytoplankton assemblage shows a high diversity with many thriving taxons. *Chlorococcales* greenalgae and the bluegreen species *Oscillatoria limnetica* Lemm. and *Lyngbya limnetica* Lemm. are of the highest cell number in the community.

Scenedesmus grahneisii was found in our samples with both two and four celled coenobia (cca. 50-50 %). Cell dimensions: 6-9 x 2.5-3.5 μm. Coenobium dimensions two celled: 6-9 x 5-7.5 μm, four celled: 8-11 x 12-13 μm. These cell dimensions are the same, as given in the literature, also there were no morphological aberrations observed.

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Table 1. Water chemical characteristics at two sample sites of Malom-Tisza (29th October, 1992)

		1.	2.
Ca^{2+}	mg/dm^3	37	35
Mg^{2+}	"	21	21.5
Na^{+}	"	30	30
K^{+}	"	15	16
CO_3^{2-}	"	0	0
HCO_3^{-}	"	200	200
Cl^{-}	"	60	60
SO_4^{2-}	"	11	10
NH_4^{+}	"	0.6	0.65
NO_3^{-}	"	0.4	0.35
PO_4^{3-}	"	0.01	0.01
pH		7.8	7.8
Conductivity	μS	494	463
COD-$KMnO_4$	mg/dm^3	9.7	11
COD-$K_2Cr_2O_7$	"	48	47

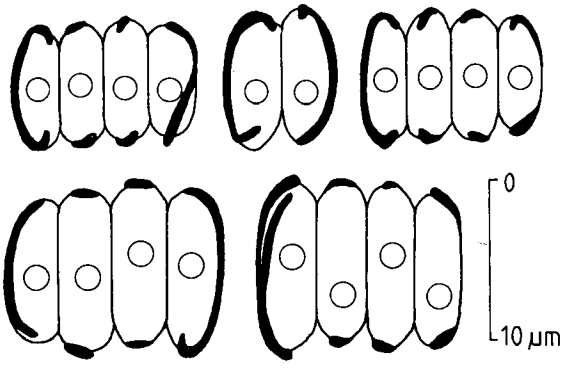

Fig. 2. *Scenedesmus grahneisii* (Heynig) Fott from the backwater at Tiszadob

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